

**What is claimed is:**

1. A countermeasure method in an electronic component using a public key cryptography algorithm based on the use of elliptic curves in which a private key  $d$  and the number of points  $n$  on an elliptic curve are used to  
5 calculate a new deciphering integer  $d'$  such that the deciphering of any message, by means of a deciphering algorithm, with  $d'$  makes it possible to obtain the same result as with  $d$ , by performing the operation  $Q=d.P$ , where  $P$  is a point on the curve to which the scalar multiplication algorithm is applied, said method comprising the following steps:  
10 1) taking a random value  $r$  with the same size as  $d$ ;  
2) calculating an integer  $d'$  such that  $d'=d+r$ ;  
3) Performing a scalar multiplication operation whose result is a point  $Q'$  on the curve such that  $Q'=d'.P$ ;  
4) Performing a scalar multiplication operation whose result is a point  $S$  on the  
15 curve such that  $S=r.P$ ; and  
5) calculating the point  $Q$  on the curve such that  $Q=Q'-S$ .
2. A countermeasure method according to Claim 1, wherein a new deciphering integer  $d'$  is calculated at each new execution of the deciphering algorithm.
- 20 3. A countermeasure method according to Claim 1, further including the step of incrementing a counter at each new execution of the deciphering algorithm up to an integer value  $T$ .
4. A countermeasure method according to Claim 3, wherein once the value  $T$  has been reached, a new deciphering integer  $d'$  is calculated

according to the method of Claim 1, the counter is reset to zero and the point  $S=r.P$  is stored in memory.

5. A countermeasure method according to Claim 4 wherein the value T is equal to 16.

5 6. A countermeasure method according to Claim 3 wherein the value T is equal to 16.

7. A countermeasure method according to Claim 1, wherein the point S is stored in memory, and steps 1 and 4 are replaced by the following steps 1' and 4':

10 1') replace r by 2.r  
4') replace S by 2.S.

8. A countermeasure method according to Claim 7, wherein a new deciphering integer  $d'$  is calculated at each new execution of the deciphering algorithm.

15 9. A countermeasure method according to Claim 7, further including the step of incrementing a counter at each new execution of the deciphering algorithm up to a value T.

20 10. A countermeasure method according to Claim 9, wherein, once the value T has been reached, a new deciphering integer  $d'$  is calculated according to the method of Claim 7, and the counter is reset to zero.

09774674-020101

11. A countermeasure method according to Claim 10 wherein the value T is equal to 16.

12. A countermeasure method according to Claim 10 wherein the value T is equal to 16.

- 5           13. An electronic component having an integrated circuit which executes a public key cryptography algorithm based on the use of elliptic curves in which a private key d and the number of points n on an elliptic curve are used to calculate a new deciphering integer d' such that the deciphering of any message, by means of a deciphering algorithm, with d' makes it possible to
- 10 obtain the same result as with d, by performing the operation  $Q = d.P$ , where P is a point on the curve to which the scalar multiplication algorithm is applied, said circuit executing the following steps:
- 1) taking a random value r with the same size as d;
  - 2) calculating an integer d' such that  $d' = d + r$ ;
  - 15 3) Performing a scalar multiplication operation whose result is a point Q' on the curve such that  $Q' = d'.P$ ;
  - 4) Performing a scalar multiplication operation whose result is a point S on the curve such that  $S = r.P$ ; and
  - 5) calculating the point Q on the curve such that  $Q = Q' - S$ .